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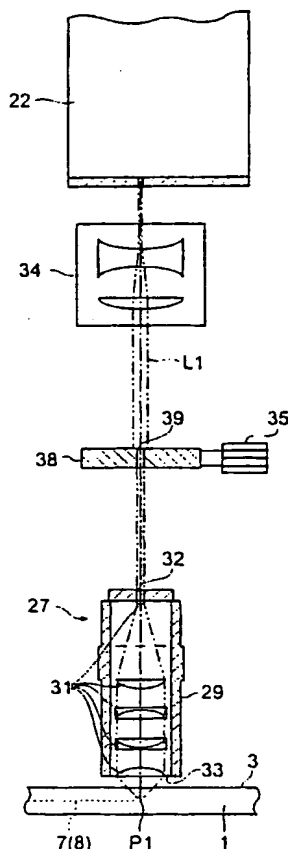
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特願2002-354234 2002年12月5日 (05.12.2002) JP
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(54) Title: LASER PROCESSING DEVICE

(54) 発明の名称: レーザ加工装置



(57) **Abstract:** A laser processing device (20) has a diaphragm member (38) with a first light passage hole (32) and a second light passage hole (39) that has the same diameter as the first light passage hole, and the device is provided on a light path of laser light (L1), which path connects a beam expander (34) and the first light passage hole (32) of a lens holder (29). The diaphragm member (38) is separated from the lens holder (29), so that, even if the diaphragm member (38) is heated by the laser light (L1) cut at a peripheral portion of the second light passage hole (39), heat is prevented from being transmitted from the diaphragm member (38) to the lens holder (29). As a consequence, positional displacement of a light collection point (P1) of the laser light (L1) caused by heating of the lens holder (29) is limited to a small amount.

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DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(84) 指定国 (広域): ARIPO 特許 (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。

(57) 要約:

レーザ加工装置 (20) は、ビームエクスパンダ (34) とレンズホルダ (29) の第1の光通過孔 (32) とを結ぶレーザ光 (L1) の光路上に、第1の光通過孔 (32) と同径の第2の光通過孔 (39) を有する絞り部材 (38) が配置されている。絞り (38) は、レンズホルダ (29) から離間しているため、第2の光通過孔 (39) の周囲部分でカットされるレーザ光 (L1) により、絞り部材 (38) が加熱されても、絞り部材 (38) からレンズホルダ (29) への熱伝達が防止される。

したがって、レンズホルダ (29) の加熱によるレーザ光 (L1) の集光点 (P1) の位置変動を小さく抑える。

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INTERNATIONAL SEARCH REPORT

International application No. 2003/015555
PCT/JP03/15555A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl⁷ B23K26/04, B28D5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl⁷ B23K26/04, B28D5/00Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2004
Kokai Jitsuyo Shinan Koho 1971-2004 Toroku Jitsuyo Shinan Koho 1994-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1338371 A1 (HAMAMATSU PHOTONICS KABUSHIKI KAISHA), 27 August, 2003 (27.08.03), Full text; all drawings & WO 02/22301 A1	1-4
A	US 6392683 B1 (SUMITOMO HEAVY INDUSTRIES, LTD.), 21 May, 2002 (21.05.02), Full text; all drawings & JP 11-156568 A	1-4
A	Kiyotaka MIURA, Kazuyuki HIRAO, "Femto-byo Laser Shosha ni yoru Garasu Naibu eno Hikari Yuki Kozo Keisei", Dai 42 Kai Proceedings of Laser Materials Processing Conference, 1997, pages 105 to 111; ISBN:4-947684-15-1	1-4

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:
 "A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

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 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "&" document member of the same patent family

Date of the actual completion of the international search
04 March, 2004 (04.03.04)Date of mailing of the international search report
23 March, 2004 (23.03.04)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/15555

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Ken'ichi HAYASHI, "Kotai Laser-Koshuha ni yoru Garasu Kiban eno Naibu Marking", Dai 45 Kai Proceedings of Laser Materials Processing Conference, 1998, pages 23 to 28, ISBN:4-947684-21-6	1-4
A	Tomokazu SANO, Shinsuke ASADA, Yoshiaki SHINJO Isamu MIYAMOTO, "Pico-byo Pulse Laser ni yoru Silicon no Kako Tokusei Hyoka -Tan-Pulse-Tanhacho Laser ni yoru Denshi Zairyo no Seimitsu Bisai Kako (first report)-, 2000, pages 72 to 73	1-4
A	Shuji TAKAOKA, "Gokuusu Handotai Wafer no Dicing ni Saiteki na Steals Dicing Gijutsu no Genri to Tokucho", Denshi Zairyo, 01 September, 2002 (01.09.02), pages 17 to 21	1-4